water, then for each run six successive samples of 750 mL were collected. Similar methodology was used to spike with and test for HPC, with initial nominal 10^5 CFU/mL.

[0226] The control and test samples were evaluated for Lp on selective agar plate medium, BCYE with glycine, vancomycin, Polymixin B, and cycloheximide (GVPC) to inhibit any HPC that might interfere with Lp growth. Colonies of viable Lp were counted after six days of incubation; the counts were based on a triplicate plate set for each sample, with results averaged to calculate CFU/mL.

[0227] LP TESTING: The control populations of Lp (meaning those not exposed to CX) were in the range of 5.30×10^4 to 1.67×10^5 CFU/mL. The populations in runs that employed the present invention had 100% elimination of live Lp bacteria. On the basis of reducing CFU/mL to less than 1 (i.e., to zero), this represented log reductions in the range of 4.72 to 5.22. Note that these are not the upper limit of efficacy, because the maximum was not evident at these CFU/mL counts.

[0228] HPC TESTING: The control populations of HPC (meaning those not exposed to CX) were in the range of 1.90×10^3 to 8.27×10^3 CFU/mL. The populations in runs that employed the present invention had 100% elimination of live HPC bacteria. On the basis of reducing CFU/mL to less than 1 (i.e., to zero), this represented log reductions in the range of 3.28 to 3.92. Note that these are not the upper limit of efficacy, because the maximum was not evident at these CFU/mL counts.

[0229] HPC testing employed the pour plate method in R2A medium, with incubation for five days prior to counting colonies.

Example 9

Effect of Pre-Washing Foams on *E. Coli* Elimination

[0230] Washing is used to remove all traces of loose CX and any soluble CA from the system, to improve safety for end users and to remove filter-based artifacts of taste and smell from filtered water. Here the filter pads were conditioned before testing by a 2-liter flush with general test water that was free of cells. The flow rate through the filter was 3.0 L/min. The filter housing had a 2.5-inch inner diameter and 10-inch inner length as in EXAMPLE 1 above

[0231] A third-party laboratory tested the efficacy of these pre-washed filter pads against *Escherichia coli* (*E. coli*) bacteria. There the filter cartridge was connected to a pressure vessel containing General Test Water #1 (GTW1, NSF P231). This water had a pH of 8.0, turbidity of 0.1 NTU, 0.5 ppm total organic content, total dissolved solids (TDS) of 188.0 ppm, and hardness of 1237.0 ppm. This water was passed through the cartridges in five discrete samples pressures for which the pressures were respectively 1 psi, 2 psi, 3 psi, 4 psi, and 5 psi at a flow rate of 3.0 L/min. and a temperature of 40.7° C. (ambient was 26.5° C.). The influent concentration of *E. Coli* was 4.1×10^7 CFU/100 mL, i.e., 4.1×10^5 CFU/mL. The pressures had no discernitble effect on the efficacy, in that the system eliminated over 99.99998% of the live bacteria, i.e., no detectable growth, and greater than log 6.6 reduction in each case.

Example 10

High-Log Data for *E. Coli* Elimination

[0232] TEST CONDITIONS: The effectiveness of filtration pads that had been made according to the invention was evaluated by a third-party commercial laboratory as follows for killing and removal of *Escherischia coli* bacteria, which provides a reliable stand-in for a variety of other pathogens in addition to itself. The test used 4.3×10^8 CFU/L for cell counts for influent. The influent water was provided with constant flow under near-ambient pressure (1 p.s.i.), at 40.5° C. (104.9° F.; cf. ambient temperature was 26.3° C.), pH 8.0, 0.3 nephelometric turbidity units (NTU) turbidity, 0.4 ppm total organic content (TOC), 184.3 ppm total dissolved solids (TDS) 129.0 ppm water hardness, 0.0 ppm total chlorine, no polyphosphate. All instruments had been calibrated or validated with NIST traceable standards. The filter pad was conditioned before testing by a 2-liter flush with general test water; the test water was free of cells. The flow rate through the filter was 3.0 L/min. The filter housing had a 2.5-inch inner diameter and 10-inch inner length as in EXAMPLE 1 above. Effluent was collected in five 1-liter aliquots and tested.

[0233] CX-FREE FOAM CONTROL: For a CX-free filter, reduction of viable cells was about 94% (94.4, 93.9, 93.6, 94.7, and 94.6%) for all five aliquots of effluent.

[0234] TRIAL: For a filter according to the present invention, the number of viable cells were reduced by a factor of over $10^{8.6}$, i.e., over 99.9999998% of the cells were killed, in all five aliquots of effluent. The effluent was tested by introduction of 100 CFU/mL of *E. Coli*, and found to have essentially no activity against the bacteria, i.e., the effluent contained no microbially detectable active ingredient (CX).

[0235] Embodiments of the invention described herein are illustrative and not exclusive. Numerous additions, variations, derivations, permutations, equivalents, combinations and modifications of the above-described invention will be apparent to persons of ordinary skill in the relevant arts and are within the scope and spirit of the invention. The invention as described herein contemplates the use of those alternative embodiments without limitation.

1) A microbicidal filtration system comprising:

a) a set of solid chlorhexidine (CX) particles having the following characteristics:

i) a purity of at least 97.0% chlorhexidine by weight, when any presence of counterions or water molecules is factored out; and

ii) no more than 3.0% by weight of chloroaniline impurities, when any presence of counterions or water molecules is factored out;

iii) the CX particles are each characterized in having a releasing surface from which molecular chlorhexidine may dissolve into an aqueous medium that passes over them or dissolve into a polymer matrix that is juxtaposed at that surface.

iv) a particle phase composition selected from the group consisting of amorphous, crystalline, and mixed amorphous and crystalline, wherein the phase composition of each particle is the same as or independent of the phase composition of a majority of other CX particles in the set;

b) a porous matrix having the following characteristics:

i) when any presence of chlorhexidine and of chloroaniline impurities is factored out, at least 90% of the matrix by weight is constituted by one or more polymers that do not dissolve in water;

ii) the porous matrix has exposed polymer surfaces that are capable of trapping chlorhexidine from an aqueous fluid in which the chlorhexidine is dissolved; and